

WHAT IS CLAIMED IS:

1. A device for transmission/reception of facsimile data in a Wireless Local Loop (WLL) system, comprising:

¹⁰⁰
an interface unit, which transmits facsimile data produced at a facsimile or matches data received in an analog facsimile protocol to wire line characteristics to provide the data to the facsimile;

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a facsimile signal processor, which receives the facsimile data from the interface unit, and converts the facsimile data into a digital signal with a radio data service format, or receives data in a radio data service format and converts it into an analog facsimile protocol to forward to the interface unit;

^{300 GSM mobile station modem}
a CDMA signal processor, which receives the radio data service formatted facsimile data from the facsimile signal processor and converts it into CDMA format, or receives data in CDMA format, converts it into the radio data format and forwards it to the facsimile signal processor; and

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a frequency modulation /demodulation unit, which frequency modulates the CDMA formatted facsimile data to forward as a radio signal, or receives and demodulates an external radio signal, and forwards the received signal to the CDMA signal processor.

2. The device of claim 1, wherein the interface unit comprises:

a jack to connect the facsimile and a Network Interface Unit (NIU);

a ring generator to generate a ring signal if a call is received for the facsimile;

a detector to detect and forward the facsimile data transmitted from the

5 facsimile; and

an Subscriber Line Integrated Circuit (SLIC) to receive a signal detected at the detector, match line characteristics for transmission of the analog facsimile data generated at the facsimile, and transmit the analog facsimile data to the facsimile signal processor.

3. The device of claim 1, wherein the facsimile signal processor comprises:

a Dual Tone Multi-Frequency (DTMF) receiver to receive a DTMF generated by the facsimile;

5 a first amplifier to amplify and forward the analog facsimile signal from the interface unit;

a modem to modulate and forward the analog facsimile signal amplified at the first amplifier, or demodulate and forward a modulated facsimile signal;

a second amplifier to amplify the facsimile signal demodulated at the modem, and forward it to the interface unit;

10 a first memory to store a radio data service format and an analog facsimile protocol;

a second memory to buffer the analog facsimile data signal and the radio data service formatted signal; and

a controller coupled to the first and second memories to convert the analog
15 facsimile signal received from the modem into a radio data service format, or convert a radio data service format data from the CDMA signal processor into the analog facsimile signal to forward to the modem.

4. The device of claim 1, wherein the radio data service format includes a facsimile service protocol, class 2, 2.0.

5. A device for transmission/reception of a facsimile data in a Wireless Local Loop (WLL) system, comprising:

an interface unit, which transmits facsimile data generated at a facsimile, or matches data received in a facsimile protocol to wire line characteristics to provide to the
5 facsimile;

a first CODEC unit, which converts a facsimile data signal from the interface unit into a digital signal, or converts a received digital signal into an analog facsimile data signal to forward to the interface unit;

a second CODEC unit, which converts the digital signal from the first
CODEC unit into an analog signal, or converts an analog facsimile protocol signal into
the received digital signal to forward to the first CODEC unit;

a facsimile signal processor, which receives the analog signal from the second
CODEC unit and converts it into a digital signal having a radio data service format, or
which receives data in a radio data service format, converts it into the analog facsimile
protocol signal, and forwards it to the second CODEC unit;

mobile station modem (MSM)
a CDMA signal processor, which receives the digital signal having the radio
data service format from the facsimile signal processor and converts it into a CDMA
format, or which receives data in a CDMA format, converts it into the radio data service
format, and forwards it to the facsimile signal processor; and

a modulation/demodulation unit, which modulates the CDMA formatted
signal received from the CDMA signal processor, or which receives and demodulates an
external radio signal to forward to the CDMA signal processor.

6. The device of claim 5, wherein the interface unit comprises:

first and second jacks to connect at least one of the facsimile and a wire
telephone set to a Network Interface Unit;

a ring generator to generate a ring signal if a call is received at the facsimile
or the wire telephone set;

a detector to detect and forward the facsimile data produced at the facsimile;
and

10 a Subscriber Line Integrated Circuit to receive a signal detected at the
detector, match line characteristics, transmit the facsimile data generated at the facsimile
to the first CODEC unit or prevent the use of the facsimile if a call is received at the wire
telephone set.

7. The device of claim 5, wherein the first CODEC unit comprises:

a first DTMF receiver to receive through the interface unit a DTMF signal
generated at one of the wire telephone set and the facsimile and forward it to the CDMA
signal processor; and

5 a first CODEC to receive the facsimile data from the interface unit and
convert it into digital data, or receive digital data from the second CODEC unit, convert
it into an analog signal, and forward it to the interface unit.

8. The device of claim 5, further comprising a switching unit, which selects one
of a computer and the facsimile signal processor to couple to the CDMA signal processor.

9. The device of claim 8, wherein the switching unit comprises:
a connecting unit to connect the computer to a Network Interface Unit;
first and second control circuits to control data transmission and reception
between the CDMA signal processor and the computer, and
5 a switching circuit to couple one of the facsimile signal processor and the
computer to the CDMA signal processor according to the data communication.

10. A signal processing device, comprising:
an interface unit to couple with at least one input device and detect and
receive a device signal or output a device signal;
a signal processor coupled to receive an interface signal and convert a data
format of the signal or provide an interface signal to the interface unit;
5 a Code Division Multiple Access (CDMA) signal processor coupled to
receive a processed signal from the signal processor and generate a CDMA formatted
signal or receive a CDMA formatted signal and output a radio data formatted signal to the
signal processor.

11. The device of claim 10, further comprising a modulating and demodulating
unit communicatively coupled to the CDMA signal processor to receive or provide a
CDMA formatted signal.

12. The device of claim 10, wherein the signal processor comprises:

- a Dual Tone Multi-Frequency (DTMF) receiver coupled to receive a control signal from the interface unit;
- an amplifier communicatively coupled to the interface unit;
- 5 a modem communicatively coupled to the amplifier; and
- a controller communicatively coupled to the modem and the CDMA signal processor, wherein the modem receives an amplified interface signal and generates a modulated interface signal, or receives a modulated signal from the controller to generate a demodulated signal as the interface signal.

13. The device of claim 12, wherein the controller further comprises:

- a first memory device;
- a second memory; and
- a central processing unit, wherein the first memory device stores a

5 prescribed protocol, the second memory unit buffers a signal to be converted by the controller, and the CPU converts a format of the data stored in the second memory according to the protocol stored in the first memory.

14. The device of claim 10, further comprising:

a CODEC device communicatively coupled to the interface unit and the signal processor; and

a switching unit to selectively couple the CDMA signal processor to one of the signal processor and a computer.

15. The device of claim 14, wherein the CODEC device comprises:

a first CODEC unit communicatively coupled to the interface unit; and

a second CODEC unit communicatively coupled to the first CODEC unit and the signal processor, wherein the first CODEC unit converts a signal received from the interface unit from a first format to a second format and converts a signal received from the second CODEC unit from the second format into the first format, and wherein the second CODEC unit converts a signal received from the first CODEC unit from the second format into a third format, and converts a signal received from the signal processor from the third format into the second format.

16. The device of claim 15, wherein the first and third formats are an analog format, and the second format is a digital format.

17. The device of claim 15, wherein the switching unit comprises:

first and second control circuits for controlling data transmission and reception between the CDMA signal processor and a computer, and

5 a switching circuit to selectively couple the CDMA signal processor to one of the signal processor and the computer.

18. The device of claim 17, wherein the switching unit further comprises a network interface unit coupled to the computer and each of the first and second control circuits.

19. The device of claim 17, wherein the signal processor comprises:

5 a controller coupled to the first and second memories to convert the modulated interface signal received from the modem into a radio data service format, or convert a radio data service format data signal from the CDMA signal processor into the modulated interface signal, and forward it to the modem

a second DTMF receiver coupled to receive a control signal from the interface unit;

a modem to modulate and forward the output of the second CODEC unit and demodulate and forward data to the second CODEC;

10 an amplifier for amplifying the signals to and from the modulator;

a memory to store a radio data service format and an analog facsimile protocol and to buffer signals to be converted by the controller.

20. The device of claim 19, where in the interface unit comprises:

first and second jacks to couple to first and second input devices;

a ring generator to generate a ring signal if a call is received at the first or second input device;

a detector to detect and forward data from the second input device; and

a Subscriber Line Integrated Circuit to receive data from the detector, match line characteristics, and transmit the data to the first CODEC unit.

21. The device of claim 20, wherein the first input device is a wire telephone set and the second input device is a facsimile.

22. The device of claim 10, wherein the signal processor receives an analog facsimile signal and converts it to a digital radio data service format.

23. A method for transmitting facsimile data, comprising:
detecting analog facsimile data from a facsimile;
providing a detection signal to a controller and a Subscriber Line Integrated
Circuit (SLIC);
5 matching line characteristics and the SLIC according to the detection signal;
transmitting the analog facsimile signal to a modem through a first amplifier;
modulating the analog facsimile signal and forwarding it to the controller;
converting the analog facsimile signal to a digital signal using a prescribed
protocol;
10 forwarding the digital signal to a CDMA signal processor;
converting the digital signal into a CDMA protocol; and
modulating the CDMA protocol digital signal.